This is the html version of the file http://mergrb.rmc.ca/igs/igssymbols/IGS_Sym4.pdf.

Google automatically generates html versions of documents as we crawl the web.

To link to or bookmark this page, use the following url: http://www.google.com/search?q=cache:85ND8kFFBbQC:mergrb.rmc.ca/igs/igssymbols/IGS_Sym4.pdf+geotextile+electrokinetic&hl=en

Google is not affiliated with the authors of this page nor responsible for its content.

These search terms have been highlighted: geotextile electrokinetic

Page 1

<span style="font-size:16px;f</pre>

Recommended Descriptions of Geosynthetics Functions, Geosynthetics Terminology, Mathematical and Graphical Symbols

Foreword

This is the fourth edition of the IGS mathematical and graphical symbols document. Since publication of the third edition in February 1996 a number of evolutionary changes (rather than revolutionary changes) have been made to reflect the further development and refinement of geosynthetics terminology. This edition will also be placed on the IGS Web Site to provide IGS members with ready access to current geosynthetics descriptions, terminology and mathematical and graphical symbols.

IGS Secretariat
226 Sitton Road
Easley
South Carolina 29642
U.S.A.
Tel: +1-864-855 0504
Fax: +1-864-859 1698

E-mail: igssec@aol.com

Page 2

Contents

I. Geosynthetics Functions3						
. Geosynthetics Terminology	4					
. Mathematical Symbols	7					
.1 General symbols	7					
3.1.1 Dimensions						
3.1.2 Units						
3.1.3 Prefixes for units						
3.1.4 Recommended subscripts						
3.1.5 Geometry and kinetics						
3.2 Properties related to geosynthetics	9					

3.2.	Physical properties
3.2.	2 Hydraulic properties
3.2.3	3 Mechanical properties
3.2.4	Interface properties
3.3 Propertie	s related to fluids11
3.3.	Physical properties
3.3.2	2 Flow properties
3.4 Properties rela	ted to geotechnics12
2.4	
3.4.	Physical properties
	3.4.1.1 Solid particles and their distribution
	3.4.1.2 Density of soils
	3.4.1.3 Voids and water in soils
	3.4.1.4 Consistency of soils
	2 Stresses in soils
	B Hydraulic properties
3,4,4	Mechanical properties
	3.4.4.1 Soil behaviour under compressive strains
	3.4.4.2 Soil behaviour under shear strains
3.5 Propertie	s related to geotechnical structures
3.5.1	Structure dimensions
3.5.2	External applied loads
3.5.3	Earth pressures
3.6 Factors of safe	ty, partial factors and reduction factors
	•••
4. Graphical Sym	bols16
4.1 Products	16
4.2 Function	s16
4.3 Multiple	products on same diagram17

1. Geosynthetics Functions

Barrier: The use of a geosynthetic material to prevent the migration of liquids or gases.

Containment: The use of a geosynthetic material to contain soil or sediments to a specific geometry and prevent its loss. The contained fill takes the shape of the inflated at-rest geometry of the geosynthetic container.

Drainage (a.k.a. transmission):The use of a geosynthetic material to collect and transport fluids.

Filtration: The use of a geosynthetic material to allow passage of fluids from a soil while preventing the uncontrolled passage of soil particles.

Protection: The use of a geosynthetic material as a localised stress reduction layer to prevent or reduce damage to a given surface or layer.

Reinforcement: The use of the tensile properties of a geosynthetic material to resist stresses or contain deformations in geotechnical structures.

Separation: The use of a geosynthetic material between two dissimilar geotechnical materials to prevent intermixing.

Surficial erosion control: The use of a geosynthetic material to prevent the surface erosion of soil particles due to surface water run-off and/or wind forces.

2. Geosynthetics Terminology

Bituminous geomembrane:

see Geomembrane, bituminous.

Bonded geogrid:

see Geogrid, bonded.

Drainage composite:

see Geocomposite drain.

Elastomeric geomembrane:

see Geomembrane, elastomeric.

Electrokinetic geosynthetic:

A composite material which may provide filtration, drainage,

reinforcement in addition to electrical conduction.

Extruded geogrid:

see Geogrid, extruded.

Geoarmour: A permeable geosynthetic material placed over the surface of the soil, in conjunction with pattern-placed block armour units, to prevent erosion.

Geobar: A polymeric material in the form of a bar, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geoblanket: A permeable, biodegradable (synthetic or natural) structure placed over the soil for temporary erosion control applications, usually while vegetation is being established.

Geocell: A three-dimensional, permeable, polymeric (synthetic or natural) honeycomb or web structure, made of strips of geotextiles, geogrids or geomembranes linked

Recommended Descriptions of Geosynthetics Functions, Geosynthetics Terminology, Math Page 6 of 24

web structure, made of strips of geotextiles, geogrids or geomembranes linked alternatingly and used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geocomposite: A manufactured or assembled material using at least one geosynthetic product among the components, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geocomposite clay liner: An assembled structure of geosynthetic materials and low hydraulic conductivity earth materials (clay or bentonite), in the form of a manufactured sheet, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geocomposite drain: A prefabricated subsurface drainage product which consists of a geotextile filter skin supported by a geonet or a geospacer.

Geocomposite reinforcement: An assembled structure of dissimilar geosynthetic materials used for soil reinforcement.

Geofoam: A polymeric material which has been formed by the application of the polymer in semi-liquid form, through the use of a foaming agent, and results in a lightweight material with high void content, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geoform: A three-dimensional, permeable geosynthetic structure, filled with soil or sediment waste such that the fill takes the shape of the inflated geoform.

Geogrid: A planar, polymeric structure consisting of a regular open network of integrally connected tensile elements, which may be linked by extrusion, bonding or interlacing, whose openings are larger than the constituents, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Page 5

1

Geogrid, bonded: A geogrid manufactured by bonding, usually at right angles, two or more sets of strands or elements.

Geogrid, extruded: A geogrid manufactured by extruding polymers and drawing in a sheet form.

Geogrid, knitted: A geogrid manufactured by knitting together yarns or elements, usually at right angles to each other.

Geogrid, woven: A geogrid manufactured by weaving yarns or elements, usually at right angles to each other.

Geomat: A three-dimensional, permeable, polymeric structure, made of bonded filaments, used to reinforce roots of grass and small plants and extend the erosion-control limits of vegetation for permanent erosion control applications.

Geomattress: A three-dimensional, permeable geosynthetic structure, placed over the surface of a soil, and then filled with concrete mortar or soil, to prevent erosion.

Geomembrane: A planar, relatively impermeable, polymeric (synthetic or natural) sheet used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geomembrane, bituminous: A planar, relatively impermeable sheet manufactured from

natural bituminous materials.

Geomembrane, elastomeric: A planar, relatively impermeable sheet manufactured from

elastomeric polymers.

Geomembrane, plastomeric: A planar, relatively impermeable sheet manufactured from

plastomeric polymers.

Geonet: A planar, polymeric structure consisting of a regular dense network, whose constituent elements are linked by knots or extrusions and whose openings are much larger than the constituents, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geospacer: A three-dimensional polymeric structure with large void spaces, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geostrip: A polymeric material in the form of a strip, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geosynthetic: A planar, polymeric (synthetic or natural) material used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geotextile: A planar, permeable, polymeric (synthetic or natural) textile material, which may be nonwoven, knitted or woven, used in contact with soil/rock and/or any other geotechnical material in civil engineering applications.

Geotextile, knitted: A geotextile produced by interlooping one or more yarns, fibres, filaments or other elements.

Geotextile, nonwoven: A geotextile in the form of a manufactured sheet, web or batt of directionally or randomly orientated fibres, filaments or other elements, mechanically and/or thermally and/or chemically bonded.

Geotextile, woven:

A geotextile produced by interlacing, usually at right angles, two or

more sets of yarns, fibres, filaments, tapes or other elements.

Knitted geogrid:

see Geogrid, knitted.

Knitted geotextile:

see Geotextile, knitted.

Nonwoven geotextile:

see Geotextile, nonwoven.

Plastomeric geomembrane:

see Geomembrane, plastomeric.

Woven geogrid:

see Geogrid, woven.

Woven geotextile:

see Geotextile, woven.

Recommended Description	ons of Geosynthetics	s Functions, Geosy	ynthetics Termino	ology, Math Pag	e 9 of 24
,					
·					
	***************************************				Page 7
			•		

3. Mathematical Symbols

3.1 General symbols

3.1.1 Dimensions

Symbols used for dimensions are:

L length

M mass

t time

T temperature

- dimensionless

3.1.2 Units

m metre

m ² square

metre

```
m
   square
                               metre
m cubic
                            metre
                  kilometre = 10
                  millimetre = 10
mm
                                                              ·6 m
                  micrometre or micron = 10
∝ m
g gram
                  milligram = 10
mg
                  kilogram = 10
kg
                                            <sup>6</sup> g = tonne
Mg
                  megagram = 10
s second
N newton
                                           3 N
kN
                  kilonewton = 10
Pa
                  pascal = N/m
                  kilopascal = kN/m
kPa
MPa
                  megapascal = MN/m
                  joule = Nm
                  tex = 10
                                       <sup>6</sup> N/tex
j/kg
                  tenacity = 10
                  degree
% percent
- pure
                          number
```

3.1.3 Prefixes for units

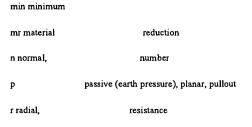
Page 8

n nano = 10 -6

3.1.4 Recommended subscripts

air, active (earth pressure), allowed B base reduction cr creep constant volume or critical state cv dry state, diameter, design failure, fibre, filament, final GSY geosynthetic material, e.g. t_{osr} is thickness of geosynthetic material GBA geobar GBL geoblanket GCE geocell GCD geocomposite drain GCL geocomposite clay liner GEC geosynthetic erosion control material GEK electrokinetic geosynthetic GFO geofoam GFR geoform GGR geogrid GMA geomat GMB geomembrane GMT geomattress GNT geonet GSP geospacer GST geostrip GTX geotextile GTXw woven geotextile GTXnw nonwoven geotextile h horizontal i immediate, initial j joint characteristic, e.g. is characteristic maximum tensile strength m material

max maximum



req required	
s	solid particles, sliding
sat saturated	
sec secant	
u undrained	conditions
v vertical	
w water	
x , y	two orthogonal horizontal axes
z	vertical axis
	at specific strain or elongation
0	at rest (earth pressure), zero
1,2,3 principal	directions

3.1.5 Geometry and kinetics

A	L 2	(m ²) area		
b , B	L	(m)	breadth or width	
d	L	(m)	diameter	
D	L	(m)	depth	
g	Lt ·2	(m/s ²)	acceleration due to gravity g = 9.8 m/s	2
H	L	(m)	height	
l, L	L	(m)	length	
t	t (s) time			

```
    t (s) time
    Lt -1 (m/s) velocity
    L J (m J) volume
```

3.2 Properties related to geosynthetics

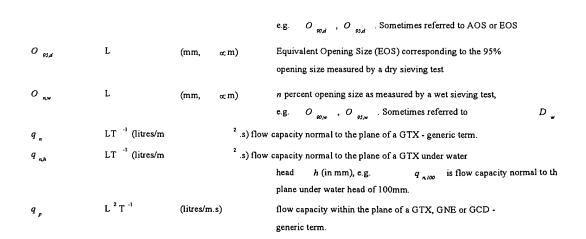
3.2.1 Physical properties

t _{otx}	L	(mm)	thickness of GTX, etc.
b _{atx}	L	(m)	width of GTX, etc.
ſ	MIL .3	(Mg/m ³)	density of fibres or filaments (mass per unit volume)
A	ML ·²	(g/m ²)	mass per unit area
d_f	L	(∞m)	diameter of fibres or filaments
	ML	(tex)	linear density of yarns, fibres, filaments
A	-	(%)	percent open area for wovens or geogrids
n _{atx}	-	·	porosity (ratio between volume of voids and total volume) of a GTX

3.2.2 Hydraulic properties

0 ,	L	(mm,	∝m)	n percent opening size of a GTX - generic term
O n.d	L	(mm,	∞m)	n percent opening size as measured by a dry sieving test,
				O O S ti f dt AOS

Page 10



q_{pi}	L ² T ⁻¹	(litres/m.s)	generic term. flow capacity within the plane of a GTX, GNE or GCD under hydraulic gradient i , e.g. $q_{_{p,l}}$ is flow capacit the plane under hydraulic gradient of 1.
k "	Lt ·1	(m/s)	coefficient of permeability normal to the plane
k p	Lt -1	(m/s)	coefficient of permeability in the plane of a GTX or GCD
	t ⁻¹	(s ·1)	permittivity of a GTX. = k_n/t_{orx}
	L 2 t-1	(m ² /s)	transmissivity of a GTX or GCD. = $k_p t_{\sigma TX}$
,	t ⁻¹	(s ·1)	permittivity of a GMB to vapour flow (permeance). It is the rate of vapour transmission divided by the vapour pressure difference across the GMB.
k' "	Lt ·1	(m/s)	vapour permeability of a GMB normal to its plane.
			$k'_{n} = t_{GMB}$
3.2.3 Mech	anical propert	ies	
		(%)	strain or elongation
,	t ·1	(%/s)	strain rate
ſ		(%)	strain or elongation at failure
max	-	(%)	maximum strain or elongation
T	Mt -2	(kN/m)	tension (tensile strength per unit width)
Τ	Mt ⁻²	(kN/m)	tension at a given elongation ; e.g. T_{∞} is t 30% elongation
T_{f}	Mt ⁻²	(kN/m)	tension at failure
T max	Mt ·2	(kN/m)	maximum tension
T _a	Mt -2	(kN/m)	allowable tension
T _B	Mt ⁻²	(kN/m)	base tension in a geosynthetic reinforcement after allowing for the effects of creep. Sometimes referred to as creep-limited strength
T meq	Mt -2	(kN/m)	required tension
J	Mt -2	(kN/m)	tensile stiffness
J	Mt -2	(kN/m)	tangential tensile stiffness at elongation
$J_{ i }$	Mt ·2	(kN/m)	initial tensile stiffness (at = 0%)
J sec	Mt -2	(kN/m)	secant tensile stiffness between the origin and
			elongation ; e.g. J_{occ30} is the secant tensile stiffness between elongation = 0 and = 30%
J secon.m	Mt ⁻²	(kN/m)	secant tensile stiffness between = n% and

elongation.

	ML 1 t ²	(kN/m	² , kPa) tensile stress at elongation ; e.g.	30	is the t
			stress at 30% elongation		
max	ML -1 t-2	(kN/m	² , kPa) maximum tensile stress		
ſ	ML 1 t-2	(kN/m	² , kPa) tensile stress at failure		
E	ML ⁻¹ t ⁻²	(kN/m	² , kPa) elastic modulus		
E_{i}	ML ⁻¹ t ⁻²	(kN/m	2 , kPa) initial tangential modulus (see J_{i})		
E	ML ⁻¹ t ⁻²	(kN/m	² , kPa) tangential modulus at elongation	(see	J
E sec	ML 1 t-2	(kN/m	² , kPa) secant modulus between the origin and elongation		
			(see J_{sec})		
	-		poisson's ratio		
,	L²t²	(N/tex)	tenacity of a yarn (ratio between tensile strength of a		
			yarn and its linear density)		
	(varies)		mechanical efficiency (ratio between maximum strength		
			and mass per unit area)		
F_{f}	MLt -2	(N, kN)	load recorded at failure in a tensile test (NB: the tensile		
_	2		test must be specified)		
F max	MLt -2	(N, kN)	maximum tensile force of a GT or GM (NB: the tensile test must be specified)		
F_{σ}	MLt ·2	(N, kN)	breaking force as measured in a Grab test (NB: the		
			Grab test must be specified)		
F_p	MLt -2	(N, kN)	breaking force in a static puncture test (NB: the static		
			puncture test must be specified)		
F_{τ}	MLt -2	(N, kN)	breaking force in a tear propagation test (NB: the tear		
			propagation test must be specified)		
O _{dt}	L	(mm)	perforation resistance in a dynamic tear initiation test		
			(NB: the tear initiation test must be specified)		
P ,	Mt ⁻²	(kN/m)	pullout resistance		
p_{B}	ML · t · ²	(kN/m	² , kPa) bursting pressure (NB: the burst test must be specified)		
W_{i}	ML ² t · ²	(Joules)	energy measuring the resistance in an impact test (NB:		
			the impact test must be specified)		
3.2.4 Interfac	e properties				
$f_{y'GST}$		(-)	friction interaction coefficient between soil and GSY.		
, BOST		``	f_{wither} tan '= tan 'miner' 'is friction angle of so	il.	

oc _{a/GST}	-	- (-) coefficient of friction between soil and GSY.								
				⊌057	and	OC #GST	=	$f_{_{\it e/GST}}$	tan	:
⊌G\$₹	-		(°)	effective	friction	angle bet	wee	n soil an	d GSY	- general term.
p, #CIST	-		(°)	effective	peak fr	iction ang	le be	tween s	oil and	GSY.
cr, #057	-		(°)	effective	large st	rain frictio	on ar	ngle betv	veen so	il and GSY.

3.3 Properties related to fluids

3.3.1 Physical properties

w	ML .	(Mg/m)	density of water (mass per unit volume)
w	ML ⁻² t ⁻²	(kN/m ³)	unit weight of water (weight per unit volume)
w	ML -1 t-1	(kg/ms)	dynamic viscosity of water

Page 12

3.3.2 Flow properties

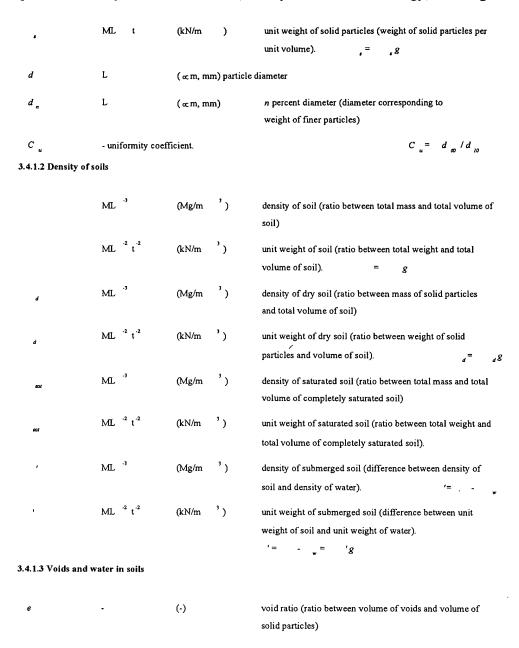
h	L	(m)	hydraulic head or potential
Q	L³t⁻¹	(m ³ /s)	rate of discharge (also called flow rate) - volume of water passing through a given area per unit of time
ν	Lt ·1	(m/s)	discharge velocity
i	•		hydraulic gradient
j	ML ⁻² t ⁻²	(kN/m ')	seepage force per unit volume (force per unit volume of a porous medium generated by action of fluid upon the solid elements of the porous medium). $j=i$

3.4 Properties related to geotechnics

3.4.1 Physical properties

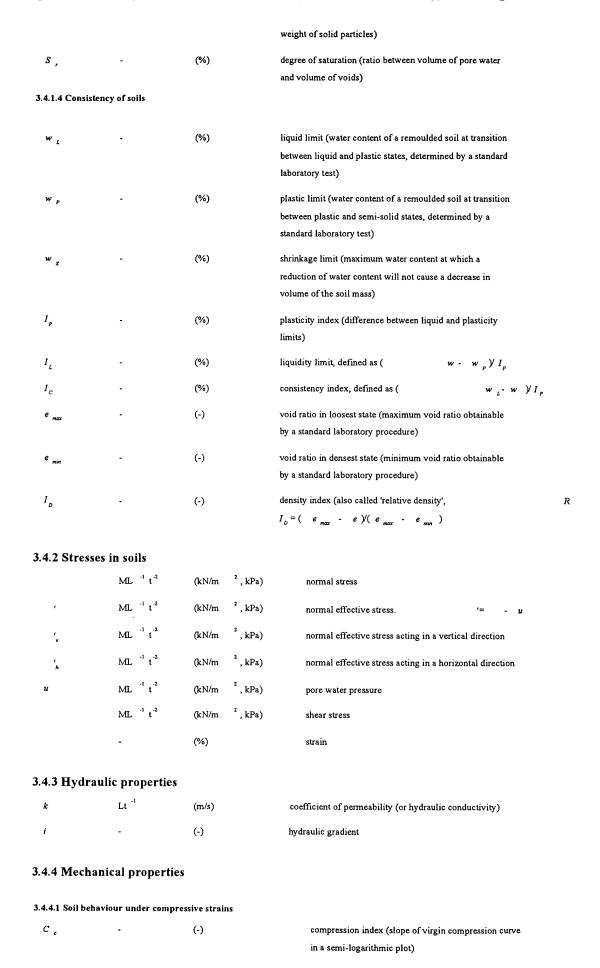
3.4.1.1 Solid particles and their distribution

•	ML ·3	(Mg/m ')	density of solid particles (ratio between mass and volume of solid particles)
	ML ⁻² t ⁻²	(kN/m)	unit weight of solid particles (weight of solid particles per



m - (%) porosity (ratio between volume of voids and total volume of soil)

w - (%) water content (ratio between weight of pore water and



in a semi-logarithmic plot)

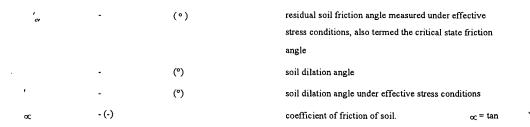
C , - (-) recompression index (slope of recompression curve in a semi-logarithmic plot).

Page 14

C c ,	L 2 t · 1 L 2 t · 1	(-) (m ² /s) (m ² /s)	secondary compression index (slope of secondary compression curve in a semi-logarithmic plot). vertical coefficient of consolidation (due to pore water movement in horizontal direction) vertical coefficient of consolidation (due to pore water movement in vertical direction)
<i>m</i> ,	M · 1 Lt ² (m ML · 1 t · 2 (kN)	²/MN) m², kPa)	coefficient of volume change (in vertical direction) pre-consolidation pressure (the greatest effective overburden pressure the soil mass has carried in the past)
E	ML ·¹ t·²	(MN/m ² , MPa) deformation modulus (ratio between a given normal stress change and the strain change in the same direction, all other stresses being constant)
<i>K'</i>	ML ⁻¹ t ⁻²	(MN/m ² , MPa) elastic bulk modulus. $K' = E/(3-6)$
k .	ML ⁻² t ⁻²	(kN/m ³)	modulus of subgrade reaction (ratio between change of vertical stress on a rigid plate placed on the soil, and the corresponding change of vertical settlement of the plate)
<i>T</i> ,	-	(-)	time factor, $T_{\nu} = t c_{\nu}/d^{2}$, where t is time and length of the drainage path
		(-)	poisson's ratio (ratio between strain changes perpendicular to and in the direction of a given uniaxial stress change)
3.4.4.2 Soil behav	iour under shear s	trains	
	ML ⁻¹ t ⁻²	(kN/m ² , kPa)	shear strength. = $c + \tan c$
ш	ML ·¹ t·²	(kN/m ² , kPa)	shear strength measured under undrained (total stress) conditions. $u = c_u + \tan u$
d	ML 1 t-2	(kN/m ² , kPa)	shear strength measured under drained conditions.

 $= c + \tan$

			$_{d} = c_{d} + \tan \alpha$
,	ML 1 t-2	(kN/m ², kPa)	shear strength measured under effective stress
			conditions. '= c' + tan '
, or	ML -1 t -2	(kN/m ², kPa)	residual shear strength measured under effective
			stress conditions. $'_{\alpha} = c'_{\alpha} + \tan c'_{\alpha}$
c	ML 1 t-2	(kN/m ² , kPa)	cohesion
c "	ML ⁻¹ t ⁻²	(kN/m ², kPa)	cohesion measured under undrained conditions
c_d	ML 1 t-2	(kN/m ² , kPa)	cohesion measured under drained conditions
c'	$ML^{-1} t^{-2}$	(kN/m ², kPa)	cohesion measured under effective stress conditions
c' a	ML 1 t-2	(kN/m ² , kPa)	residual cohesion measured under effective stress
			conditions
G'	ML ⁻¹ T ⁻² (MN	I/m ² ,	elastic shear modulus. $G' = E /(2+2)$.
		MPa)	
	-	(°)	soil friction angle
н	-	(°)	soil friction angle measured under undrained conditions
d	-	(°)	soil friction angle measured under drained conditions
,		(°)	soil friction angle measured under effective stress
			conditions



3.5 Properties related to geotechnical structures

3.5.1 Structure dimensions

b , B	L	(m)	breadth of foundation, slope or embankment
D	L	(m)	depth of foundation, depth below toe of slope
h , H	L	(m)	vertical height of wall, slope or embankment

h , H	L	(m)	vertical height of wall, slope or embankment
l, L	L	(m)	length of foundation or embankment
s	L	(m)	settlement
U	•	(%)	degree of consolidation
	-	(°)	angle of slope to horizontal

3.5.2 External applied loads

F_h	MLt ⁻² or Mt	² (kN or kN/m) external applied concentrated horizontal force
F_{ν}	MLt ⁻² or Mt	⁻² (kN or kN/m) external applied concentrated vertical force
w.	MIL ⁻¹ t ⁻²	(kN/m ² , kPa) external applied surcharge load

3.5.3 Earth pressures

K	-	(-)	ratio of horizontal to vertical stress
K a		(-)	active earth pressure coefficient
K ,	-	(-)	at-rest earth pressure coefficient
K	•	(-)	passive earth pressure coefficient
	ML ·1 t·2	(kN/m ², kPa) wall adhesion (adhesion between wall and adjacent soil)
	-	(°)	angle of wall friction (angle of friction between wall and adjacent soil)

3.6 Factors of safety, partial factors and reduction factors

FS	-	(-)	global factor of safety (normally derived from limit equilibrium methods)
cr		(-)	reduction factor associated with the loss in load carrying capability due to creep effects of a reinforcement over time
ſ	-	(-)	partial factor associated with dead loads in a structure
q	-	(-)	partial factor associated with live loads in a structure
m	-	(-)	partial factor associated with the strength of the

mr	•	(-)	reduction factor associated with the loss in load carrying capability due to installation and durability effects of a reinforcement over time
n	-	(-)	partial factor associated with the economic ramifications of structural failure
P	-	(-)	partial factor associated with the pull-out resistance of geosynthetic reinforcements
•	-	(-)	partial factor associated with the sliding resistance of geosynthetic reinforcements

4. Graphical Symbols

4.2 Functions

4.1 Products	
GTX	Geotextile (generic)
GMB	Geomembrane (generic)
GBA	Geobar (generic)
GBL	Geoblanket (generic)
GCD	Geocomposite drain (generic) with geotextile on
	both sides
GCE	Geocell (generic)
GCL	Geocomposite clay liner (generic)
GEC	Surficial geosynthetic erosion control (generic)
GEK	Electrokinetic geosynthetic (generic)
GGR	Geogrid (generic)
GMA	Geomat (generic)
GMT	Geomattress (generic)
GNT	Geonet (generic)
GSP	Geospacer (generic)
GST	Geostrip (generic)

The following function symbols may be used where it is considered that a description of the role of the geosynthetic material may provide further clarity to the drawing or diagram.

B Barrier

(fluid)

С

Containment (soil & sediments)

D Drainage

(fluid)

E

Surficial erosion control

F Filtration

P Protection

R Reinforcement

S Separation

Page 17

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

BLACK BORDERS

IMAGE CUT OFF AT TOP, BOTTOM OR SIDES

FADED TEXT OR DRAWING

BLURRED OR ILLEGIBLE TEXT OR DRAWING

SKEWED/SLANTED IMAGES

COLOR OR BLACK AND WHITE PHOTOGRAPHS

GRAY SCALE DOCUMENTS

LINES OR MARKS ON ORIGINAL DOCUMENT

REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY

IMAGES ARE BEST AVAILABLE COPY.

OTHER:

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.